

The Habits of Malay Reptiles.

BY H. N. RIDLEY.

In putting together these few notes on the habits of some of our reptiles, I would commence by calling attention to the very valuable paper on the Reptiles and Batrachians of the Malay peninsula by Lieut. S. S. Flower, published in the Proceedings of the Zoological Society for December, 1896, page 856. This paper gives a list of all species recorded from this country, and I have made much use of it. The earliest important paper on the subject is that by Dr. Cantor, published in 1847, and a good number of kinds mentioned by him have not been met with since. Some were perhaps erroneously identified or wrongly localised, and some perhaps have disappeared. Others, however, have doubtless been overlooked, and that is especially the case in the tortoises, and the smallest lizards. Snakes are often preserved by amateurs, as are the showier lizards, but the other reptiles often escape collection. No better instance of this is that of the big Gavial *Tomistoma*, which was really first recorded as belonging to our fauna in 1896, by Wray, although it appears to be by no means rare in the Pahang and Perak rivers, and must at times have been the victim of the sportsman long ere this.

TORTOISES.

There are several kinds of land tortoises to be met with here, and one of the commonest is the jungle tortoise *Geomyda spinosa*. It is rather a small tortoise about eight inches long, and of a dull red colour, just the colour of the rotting leaves in the streams of the jungle where it lives. Its head and feet are black, with pink spots. When young the edge of its shell is armed with spiny processes, whence its name, but these disappear as it grows older. It seems never to leave the damper parts of the forests, and is seldom far away from the small streams. These tortoises eat all kinds of vegetable substances, fruit of all kinds and leaves, and I once found two small ones greedily devouring

a fungus. Their tenacity of life is, as in most tortoises, very great. I once brought one from Bukit Timah, where they are common, for the Museum, and on preparing its skeleton it was found that by some accident the carapace had broken clean across, and though the edges had not joined, the damage had been evidently repaired as well as possible some time previously. Afterwards I heard that some visitors to the bungalow had found one of these tortoises and carried it up to the top of the turret, whence it had fallen upon the gravel path, and though it seemed much injured, it managed to creep away, and I have little doubt that this must have been the same tortoise which had thus recovered from this severe injury.

Cyclemys platynota, the flat-backed tortoise, is a rather larger animal, recognised by a peculiar flattening on the top of its shell. It is usually a very shabby, disreputable looking animal, with a dirty brown irregular carapace. It is less often noticed, as it is even more aquatic than the jungle tortoise, remaining under water most of its time. It seems to be abundant in the river at Selitar bungalow, where Dr. Hanitsch got several, and it has turned up in the Botanic Gardens, once in the Lake and once in a smaller pond, where it was devouring the waterlilies. In captivity it will eat rice, fish, leaves or fruit.

The box-tortoise, *Cyclemys amboinensis*, is very common in the rice fields in Malacca, and used to be common in Singapore, but is now getting scarce here, as its haunts are being either drained or cultivated or built on. I have been told that it was formerly plentiful on the ground on which is now the Tanglin Market. It is a very pretty little tortoise with a very round back, black and smooth, the lower carapace yellow, and its head black with a bright yellow band on each side. The end plates of its under shell are jointed upon the others, so that it can close itself entirely within its carapace if alarmed, whence its name of box-tortoise. It is very fond of the water and often remains therein, only projecting its snake-like head above the surface. However, it often leaves the water and rambles about, especially in the evening, in search of food, and I have seen them run over by bullock carts on the roads in Malacca. They are very easily kept and are quite omnivorous, eating fish, boiled

rice, frogs, fruit, and green vegetables with equal pleasure. They lay rather large, oblong, blunt-ended, white eggs, two or three, or as many as five at a time, which they bury in the sand. The shell is remarkably hard for a reptile's egg, and the eggs, two inches long, are very large for the size of the tortoise.

The large land-tortoise, *Testudo emys*, does not occur in Singapore, but is not very rare in Perak, especially in the Dindings, and is said to occur in Penang also. I got a very fine female at Telok Sera, in the Dindings, which laid two eggs shortly after I got it. They resembled those of the box-tortoise, but were larger. This tortoise lives in the drier parts of the woods, and does not seem to care about water at all. It eats all kinds of leaves voraciously.

Several kinds of snapping-turtles (*Trionyx*) are recorded from the peninsula, but the commonest is *Trionyx cartilagineus*, a very large flat turtle, the shell of which is covered with a leathery, dark gray skin, often marked with olive spots, and which is continued as a flange all round the shell. The head and neck are gray with small yellow spots, and the snout is long and pointed, giving the animal a very ugly appearance; the feet are very thick and powerful, ending in sharp claws.

These turtles usually live in tidal rivers, but sometimes get into ponds. They rarely leave the water, but may be seen pushing up their heads above the surface from time to time. One was caught in the ditch by the Museum some years ago, and was transferred to the Gardens' lake, where it eventually became very large, and attacked some of the water birds with great ferocity, killing and devouring some flamingoes. It was eventually trapped and destroyed. Though these animals are properly carnivorous, they seem very fond of boiled rice, and the ones in the Garden lake used always to come and feed off the rice put down for the water fowl, and those in captivity are fed for the most part on boiled rice made up in balls. The Chinese are very fond of these turtles, and their flesh fetches a high price in the markets. The Malay name for them is *Labi-Labi*.

The Chinese have a superstition about tortoises, which they consider emblems of longevity, the tortoise, with the dragon and phoenix being the first three animals in the world when it was created. They catch or buy as many tortoises of

any kind as they can get, and after writing their name on them release them in a suitable spot. These tortoises are supposed to bear away the sins of the men whose names they bear, and no Chinaman will kill or buy a tortoise so inscribed for fear of being burdened with the sins of some one else. This probably accounts for the appearance of a considerable number of turtles and of the flat-backed tortoises in the Gardens lake, within late years, and the temple of tortoises in Penang is also used as a place of safety for sin-bearing tortoises.

In the seas round the peninsula four kinds of turtles are to be met with. The well known green turtle, *Chelone mydas*; the Loggerhead, *Thalassochelys caretta*; the Leathery turtle, *Dermatochelys coriacea*; and the Hawks-bill, *Chelone imbricata*. The habits of the green turtle are familiar, from books at least, to every one. It is still common enough along our sandier coasts, and I have often seen it putting up its head above water, especially in the early morning, off Lumut in the Dindings, and elsewhere. It is a vegetable feeder, eating seaweeds, and probably, as seaweed is very scarce in our waters, it also eats the Setul, a grass-like flowering plant, common in muddy spots round the coast. The logger-head is a large turtle which feeds on marine animals, and is recognized by the yellow markings on its head and flippers. It may often be seen just outside Singapore harbour, putting its head above water, and then diving again, remaining a long time under water. The huge leathery turtle, has only once appeared on our coasts, a large specimen now in the Museum having been caught at Tanjong Katong. It is also carnivorous, and like the last-mentioned turtle is uneatable. The Hawk's bill occurs in the neighbouring seas, and I have seen live ones brought into Singapore, but whence I could not discover. Some years ago, while up the Sepang river in Selangor, a good way above tidal waters, I saw a turtle slip off the bank into the river. It swam very fast down stream, pursued by the boatmen, and then turned and came past me quite close. Its paddles were moving very rapidly and it lay right over almost on its side, as if to reduce the amount of friction against the water as much as possible. It eventually got into a deep hole, whence we could not get it out. From what I could see of it, it appeared to be a Hawk's bill.

CROCODILES.

Crocodiles. The common crocodile is *Crocodilus porosus*. Cantor mentions *C. palustris*, the Mugger of India, as occurring in Penang, but as being less common than the other kind. Lieut. Flower has seen a young specimen from Singapore in the British Museum and Mr. Butler has got one in Selangor. This crocodile is distinguished by its shorter and broader snout, and by having five teeth in its premaxilla, and not four only as the common kind has. It seems also on the whole to be a smaller animal.

The common crocodile varies in colour, being sometimes black and yellow, at others entirely black. The Malays consider the yellow variety as being the most dangerous. This species is strictly speaking a tidal river or marine animal. It seldom goes far up rivers beyond tidal waters, and it sometimes goes very far out to sea. I saw the skull of one at Cocos Island, which had turned up there some months before my visit, and which must have swam at least 200 miles in the sea ere reaching the islands. They sometimes leave the water and go for some distance inland, apparently trying to get across from one river to another. I saw one which had just been killed in a coffee estate near the caves at Kwala Lumpur, where it had been found wandering about among the coffee, at no great distance from the river, however. Of the ferocity and cunning of this, our most dangerous wild beast, there is no need to write, it is too well known; but I will mention one incident concerning it. Some years ago, a Malay forest-guard was in a mangrove swamp at low tide, the water where he stood being only a foot deep, when a crocodile suddenly rose out of the mud on its hind legs and bit him on the elbow. The man tore his arm out of its mouth, and it rushed off. The Malays' theory on the subject was that the man was standing on or close to the animal's nest, but it seems curious that the crocodile should be buried in the mud in such a manner, and that it should spring at his arm and not bite him on the leg, which would be the nearest part to him. In captivity the crocodile is rather a stupid animal, but a young one kept in the Gardens has learnt to come out of the water for a piece of meat when whistled to.

Of the habits of the Gavial, *Tomistoma Schlegeli*, but little is known at present. It occurs in the Perak and Pahang rivers, where, above Kwala Tembeling, I have seen tracks on the sand banks probably of this species. Sportsmen far up the larger rivers should keep a look-out for this animal, as well as for the Mugger, for it may be much more widely distributed than at present appears.

LIZARDS.

Our largest land lizard is the Monitor, *Biawak* of the Malays, often erroneously called an Iguana here, *Varanus salvator*. This animal attains a length of seven feet, but its tail forms, a large proportion of that length. It always lives near water, either river or pond, or the sea, in which it quickly takes refuge when pursued. It dives very well, and remains a long time under the water. If it is unable to get into water, it will quickly climb a tree when alarmed. It gallops at a great pace when frightened, though very clumsily, and the noise it makes dashing through the bushes is out of all proportion to its size. When cornered, it defends itself by lashing out with its tail, and making a fuffing noise like a spitting cat. It also bites very fiercely. It is carnivorous, feeding on birds, rats, fish and insects, often attacking poultry. When a rat is given to it, it seizes it in its mouth and shakes it like a dog, then after biting its body all the way down till all the bones are broken, swallows it whole. In captivity I have never heard it make any noise but the spitting sound, but Malays have told me that a loud barking ha-ha-ha which I have heard in swamps is the cry of the Biawak. The eggs are large and white, with a soft shell like that of a turtle, and are deposited in holes in sandy ground and covered up. I once found at Bruas, in the Dindings, a monitor laying its eggs in a shallow hole. The Malays, however, have a story to the effect that when the eggs of a crocodile hatch, all the young ones which go towards the water become crocodiles and those which run on the land become Monitors.

Besides the common Monitor, *V. salvator*, there are three other kinds to be met with here. *V. flavescens*, Penang and Jelebu; *V. nebulosus*, Penang and Malacca; and *V. rudicollis*, Malacca. These are all smaller than the common kind.

The pretty sand lizard, *Liolepis Bellii*, about a foot long, and beautifully ornamented with blue and red, is very common on the sandy plains of the Pahang river, and I have also seen it in Malacca, at Pengkalan Kumpas, and at Bruas, in the Dindings. It can be seen sitting in the sun in the heat of the day, sunning itself, but never far from its hole, into which it darts with surprising rapidity.

The Chamæleon Lizard, *Calotes cristatellus*, is very common in all gardens. Its ordinary colour is bright green, but when vexed it turns to a dusky brownish colour, whence its popular name. When alarmed it runs very fast on the ground, holding up its long whip-like tail, to the nearest tree or post, up which it climbs, and if this is not high enough to be safe, springs on to a higher one. If a human being happen to be in its way, it does not delay to run up to his shoulder or head and jump off from there. The distance it can jump from tree to tree is very considerable, having regard to the size of the animal. It generally lays two eggs at a time, but Lieut. Flower found females of another species, with as many as seven or eight eggs in them, the eggs are about an inch long, narrow cylindrical blunt at both ends, and enlarged rather abruptly in the middle. They are white and leathery. The lizard places them side by side on the ground in a damp spot and leaves them, not attempting to conceal them. If attacked by a dog the *Calotes* runs for a short distance, and then turns and rushes at its enemy with open mouth, springing at its nose and biting sharply, but is soon tired out and killed. In spite of its teeth and the spines that protect its head and neck, it frequently falls a victim to the attacks of sparrow-hawks and snakes, and the Monitor is also very fond of it. The Malays hold it somewhat in horror, as being one of the forms in which wizards send out their imps to annoy their enemies.

The flying lizard, *Draco volans*, is at times very common. It appears to move about in flights, for while perhaps for some months hardly any are to be seen, at other times one may see half a dozen in a morning. They appear usually in the hottest part of the day, sailing from tree to tree, always selecting trees with grey smooth bark of the same colouring as themselves. Furthermore they nearly always choose the same trees for their

route, so that when they appear in the Gardens one knows exactly which tree one will find them on. When they alight on a tree they run up, puffing out and contracting the conical pouch in the throat, which is bright yellow in the male and blue in the female, and licking up the ants, which form their chief food. When they have climbed sufficiently high, they spring off again spreading the wings (which are expansions of skin on the elongated ribs) after they are in the air, and closing them as they alight. Though they usually go in straight lines, they can swerve in their flight, apparently by lying slightly over on one side or the other. I have seen one avoid a bush which was in its line of flight in this way. The distance that they can cover depends on the height from the ground of the point from which they spring, for as in the case of all animals that fly in this manner (the flying squirrel and flying lemur), they descend in their flight; but the longest flight I have measured was twenty-five yards, from a height of not more than fifteen. These animals are able to change colour, as the *Calotes* does, the blue ornamental patch on the head disappearing, and the whole lizard becoming of a brown hue, except the pouch, which retains its colour.

D. volans is by far the commonest species here, but there are four or five other kinds to be met with, which generally occur in thick forests, and are very difficult to collect, as they very quickly fly out of reach, and can only be obtained with the gun.

The common Scinc, *Mabuia multifasciata*, a stout brown metallic lizard, ornamented with a glowing red patch along the side just below the head, is very abundant in the grass and along drains, creeping about when the sun is bright and hiding in holes and under roots when alarmed. When closely pursued by a dog, the Scinc will sometimes take to a tree, climbing up well out of reach, and when roughly handled it sheds its tail, as do the Geckos, the tail skipping about very actively for some minutes after it drops. It readily takes to water, diving in when frightened and remaining a long time below the surface. Besides this common Scinc, there are one other *Mabuia* and seven smaller scincs of the genus *Lygosoma* recorded from the peninsula, most of which are either very scarce or difficult to find or very

local. One, *L. jerdonianum*, seems to be absolutely confined to Pulau Tikus in Penang, having never been seen anywhere else. Every one in the tropics soon makes the acquaintance of the House Geckos, and the habits of these useful little insect killers are well known, and have often been described, but it does not seem to be generally known that at least eight species belonging to four genera inhabit our houses. In some houses the common one is *Gehyra mutilata*, a very pale colored and rather small kind, in others the large dark brown *Gecko Monarchus* takes its place, or drives it at all events out of the verandah, which is evidently considered the best feeding ground by the house geckos. In other houses again quite different ones appear. The Siamese Tokay, *Gecko verticillatus*, a large kind with an exceedingly powerful voice, has been recorded from the peninsula, and even from Singapore, but this latter locality must be very dubious. We have, however, another very loud voiced one (probably *G. stentor*) in the forests, where it lives in hollow trees, and utters a very loud call.

Besides these house geckos, there are a number of jungle geckos, which live in holes in trees or under bark, only appearing at dusk. A very odd little one, *Gonatodes kendalli*, lives in cracks and holes under large rocks in the Bukit Timah woods. It is dark brown, and has an unusually long tail, which it often carries over its back coiled up like a watch spring when it runs.

SNAKES.

The ordinary visitor to the tropics is filled with a nervous horror of snakes, always expecting to find most deadly kinds in the house or to be attacked by them if he sets foot outside. He conceives it his duty to slaughter all, even the most harmless and useful species, as soon as he sees them. Nor is his opinion altered by conversation with Malays, who assure him that even the most inoffensive of them are horribly deadly. Malays have pulled me back in horror when I was picking up a little *Typhlops*, a snake about the size of a moderate-sized earth worm, with a mouth too small even to nip a portion of one's skin, assuring me that it was a most venomous animal. The visitor, however, if of an observant turn of mind, discovers ere long that poisonous snakes are comparatively rare, and that cases of dangerous

snake-bite are exceedingly rare, and the risk of injury from snakes is so infinitesimal that it may be utterly neglected as one of the dangers of the tropics. Cases of death from snake-bite are from time to time recorded, but, usually at least, the snake is not identified, sometimes not even seen, and it is clear that there has been a good deal of guessing as to the cause of death. Good records of cases by persons who know the poisonous snakes by sight would be very useful. Death from snake-bite in India seems to be remarkably common, why should it be so rare here? The only really probable suggestion I have heard was made by a native who had lived in India, who pointed out that while in India the snakes mostly live on the ground, here they live high up in the trees, and there is a good deal in this; I have seen the green viper and hamadryad both brought down from the tops of trees forty feet high. Squirrels and tupaia's, some of the rats, as also the birds on which these animals mostly live, reside high up and seldom come to the ground, and the snakes pursue them there, while the hamadryad pursues the other snakes. Another fact seems to be clear, which is that some snakes, notably the green viper, imagined to be very deadly, is indeed not nearly as dangerous as it is supposed to be, but of this more anon. It may, however, be pointed out that the most destructive of the Indian snakes are the cobra, the *Ticpolonga* or *Daboia* and the Krait. The two latter are absent from the peninsula, and the Cobra does not seem to be very dangerous here.

I should hardly have thought it worth while to allude to the serpent fascination myth, except that recently, at the British Association, a paper was read to disprove the popular error that snakes fascinate or mesmerise their prey before catching it. Anyone who has ever kept snakes knows that nothing of the kind ever happens, but like the theory of the imitative powers of apes and the fiction that the man-eating tiger is invariably an old animal which has lost its teeth, these popular errors seem to take an unaccountably long time to die. Snakes either quietly creep up to their prey, and seize it when asleep or resting, or wait in likely spots for the prey to come to them. Many, especially the larger snakes, are nocturnal or hunt only in the twilight, when their prey can hardly see them. The smaller insect-

eating snakes chiefly work by day. Most snakes are colored for concealment, and inhabit spots suited for their coloring. The green viper (*Lachesis Wagleri*) sits usually about 4 or 5 feet high in a bush, in a sunny spot, where its blue-black, green and yellow mottling is matched by the spots of light and shade on the bright green leaves. The python, again, with its light and dark brown carpet pattern, resting among dead leaves, or in the hollow of a tree, is equally inconspicuous; even poisonous snakes, which sometimes are very gay with warning colors, are by no means as conspicuous as they appear. The beautiful *Elaps bivirgatus*, with its scarlet head and tail and deep blue body, is wonderfully invisible in the shadows of the woods, but when in danger it exhibits its brilliant coloring as plainly as it can, in order to warn the enemy that it is venomous, and can give a fatal bite if it chooses. *Callophis* is another genus of poisonous snakes that is brightly colored. In danger, however, it does not trust to its warning colors only, but beats its tail quickly on the dead leaves, making a rattling sound. A terrier which came upon one of these small snakes, and was about to kill it, stopped at once when the snake began to rattle its tail, and went away, evidently understanding the signal. *Bungarus* again, a large and dangerous black and yellow snake, makes the same kind of rattling. A poisonous snake will not as a rule waste its poison on an animal it cannot swallow, and naturally prefers to drive its enemy off by frightening it, if it can.

Snakes, like many of our wild animals here, know very well the conspicuity of motion, and when crossing an open space such as a road, where they are visible from some distance, usually remain perfectly motionless if an enemy comes in sight and they have no time to get into shelter. This is why they are more often seen on roads by persons driving or walking than elsewhere. Being alarmed when crossing from wood to wood, they remain motionless for some time, in the hope that they may be taken for a root or piece of stick. I have seen a terrier, who invariably pursues snakes when she sees them, jump over one lying on the path, mistaking it for a stick. Had it moved, she would have immediately killed it.

There are no less than one hundred and ten kinds of snakes recorded as occurring in the peninsula, and more than half of

these have been found in Singapore. A number have only been collected once or twice, and some of the records may be considered doubtful, but as only a small part of the peninsula has been yet collected in, we may expect large additions as time goes on.

One of the commonest is the Python (*P. reticulatus*), the Ular Sawah of the Malays. It is perhaps the largest snake in the world, a specimen measuring 40 feet having been reported as obtained by a scientific expedition in Manila. Pythons of 20 feet in length are by no means uncommon here, and specimens of 26 feet are occasionally met with, but accurate measurements of larger ones are still required. The python is nocturnal in its habits, remaining concealed under bushes or fallen logs during the day, and wandering about at night in search of food. It eats squirrels and rats and birds, and often makes its way into a hen-house, where it not only eats half a dozen or more chickens in a night, but usually kills more than it eats. The larger ones will also eat dogs and cats, goats and pigs. A snake a little over seventeen feet long ate two black swans on the garden lake at the rate of one a month, and I have had a python of about 15 or 16 feet long brought me, which had just swallowed twelve ducks. On one occasion five pythons were put together into a large cage. The biggest was a little over nineteen feet long, another was between 17 and 18 feet, and the other three were from 12 to 15 feet in length. The biggest snake ate all the three smaller ones in two nights, and attacked the remaining one, which however succeeded in beating it off, not without being wounded. But although they are sometimes very voracious, they will often go without food for a very long period. A large one, twenty feet long, was fed on a good sized pariah dog, after which it refused food for nine months, when it passed the remains of the dog, and began to feed again. Another remained for seven months without food, in the same manner. Smaller snakes feed oftener, usually once a month, and sometimes even oftener than that. A hungry python strikes its prey with lightning-like rapidity, usually seizing it by the head, if it is small enough, in which case the animal or bird is killed by the crushing of the head. It then, turning its head down, encloses the prey in a coil and a half and proceeds to swallow it slowly. In the case of fairly large animals, and those that are not killed by

crushing the head, the prey is crushed by the coils. In the case of a swan swallowed by a fair sized python, the head was crushed, evidently by the first bite, but the bones of the body were not broken at all, although the bird was very much thicker than the python. In some books it is stated that the prey is smothered in the coils, but as a matter of fact, the bite of the python is severe enough to cause instant death in most of the smaller victims, and the contraction of the coils crushes the larger ones. The main use of the coils in the case of small animals and birds is apparently partly to hinder their struggling, and partly to push the carcase into the proper position for swallowing, and to assist the deglutition by pressing the food against the other coils and the ground. It is only when the prey has almost disappeared down its throat that the snake straightens itself out. The Chinese eat the flesh of the Python, and the fat, of which there is usually a good deal, is a popular native medicine. In colour the python varies somewhat, young and half-grown specimens being often almost golden yellow. I have also seen a very dark, almost black variety.

P. molurus, the Indian python, is recorded from the peninsula, but I have not seen it.

P. curtus, the little red python, formerly considered very rare, does not seem to be so in the peninsula. It is quite small for a python, only 8 or 9 feet long usually. It is a quiet snake in captivity and seems chiefly to feed on rats.

The little burrowing snakes, *Typhlops*, are to be found in rotten cocoanut palms, and other trees, in the sawdust of the saw mills, and in the ground. A great number of kinds have been described, but they are very difficult to identify. Our commonest species is *Typhlops braminus*. It is usually about four inches long, and very slender, with a very small head, and minute eyes, and a sharp-pointed tail. Its colour is lavender grey, or black, and it is very active, wriggling like a worm when disturbed.

Cylindrophis rufus is another burrowing snake, but is much larger, about a foot long. It is black, with white bands beneath, some red on its neck, and a bright red tip to its tail. It is short and thick, and has an odd habit of flattening itself out, and turning up the tip of its tail. It is common in gardens, burrowing in the ground.

Chersydrus granulatus Schn. is a short thick blunt-nosed snake, alternately banded with dirty brown and white. It seems to be rare here, only two specimens being recorded from the peninsula, in Flower's list. One was recently brought to me which had been found in the road near the gardens. As it is an aquatic snake which lives on fish, it is probable that it was attempting to cross from some ditch which had dried up from the very hot weather, in order to find another wet spot.

There are many very pretty harmless tree-snakes, slender long-tailed reptiles, often gaily coloured. They usually creep about in bushes at no great height from the ground, moving very briskly when disturbed. Such are the snakes of the genera *Dendrophis*, *Dendrelaphis* and *Dryophis*.

Dendrelaphis caudolineatus is a very common kind, brown with a bright yellow band down its side. It seems more or less gregarious, as I have seen three in one bush. When annoyed I have noticed it emits an appalling odour of carrion.

The little snakes of the genera *Ablabes* and *Simotes*, though allied to *Dendrelaphis*, are generally to be met with creeping on the ground, or concealed beneath logs or stones. They never seem to climb into trees, and being terrestrial are usually dull brown, sometimes marked with red. *Simotes purpurascens*, which I got from the Bukit Timah road, was dark brown with large distant red spots and a bright red belly. *S. signatus* I found under a pile of tiles in the garden. It was also dull brown. *S. octolineatus*, which is perhaps the commonest kind, is a bigger and gayer-coloured animal, brown or yellow with eight black lines running its whole length, a red bar down its back and a red belly.

A very interesting and common snake is *Macropisthodon rhodomelas*, a slender terracotta red snake, usually about a foot long, with a curious bluish triangle on its neck in a black V, and a black line down its back. It is often to be seen gliding through the grass or across paths in the day time. Its peculiarity is its means of defence. When vexed, it sits up after the manner of a cobra, and seems to flatten out its neck as if it was trying to imitate that species, while from the bluish patch on its neck are exuded some drops of a white viscid liquid representing the well-known cobra marks. I noticed that my dog, seizing this

snake in its mouth to worry it, presently foamed at the mouth, as if he had been licking a toad, and soon dropped the snake. I tasted the exudation, and found it bitter, but it had no effect on my salivary glands. It is evident, however, that it must act as a deterrent on its enemies, and perhaps the cobra-like habit of sitting up may also alarm an animal about to attack it, but I must admit the actual resemblance to a cobra is not really very great. This snake possesses two very long glassy fangs at the back of its mouth, which might lead persons to suppose that it is venomous, but the poison fangs of a dangerous snake are in the front of the mouth, and *Macropisthodon*, though it can bite sharply, is not poisonous.

There are a good many snakes of the type usually popularly known as Rat-snakes, and Water-snakes, several of which attain a considerable size, seven or eight feet long. The black ones such as *Coluber melanurus*, which I have found under a pile of rotten boards, are often mistaken for cobras and promptly slain, whereas as rat-killers they might be encouraged. *C. taeniurus*, the cave snake, which I described in the last number of the Journal, has been recently caught by Mr. Rostados at Kota Tinggi, in Johore, far away from any caves or rocks, and this specimen is certainly more of the olivaceous colour described by Boulenger, and not so white as that of the caves.

Dipsadomorphus dendrophilus is a common and very beautiful harmless snake of considerable size. It usually lives in mangrove swamps, where it sits coiled up on the branches waiting for birds or rats. Its colouring is an intense glossy black with bright yellow bands, and in this it resembles the deadly *Bungarus fasciatus*, also a mangrove-haunting snake, but whether this can be classed as a genuine case of mimicry or is only an accidental resemblance it would be hard to say. It is a very quiet snake, and becomes quite tame very shortly after capture. One captured on the Sirangoon river, where it is very abundant, laid four rather large oblong white eggs, soon after it was caught. The Malays call it Ular ranke or Ular chin-chin mas.

D. cynodon is another common species, about five feet in length. There are two colour forms of this, which look so different that one would hardly recognize them as the same. In one the body is bright brown with darker blotches and a yellow

throat. I caught a fine one on Gunong Keledang in Perak, among thick fern. The other form is almost black with a few yellow marks, about its head. One was brought me by a small Malay boy from Tanglin village, where he declared it had been killing the fowls.

Zaocys carinata is a large harmless snake, of which I caught a very fine specimen, about eight feet long, after a considerable chase. It was almost completely black, but there are also light-coloured varieties. It moves very rapidly, and I could hardly keep up with it though I was running on the path and it was gliding through the scrub. The Malays called it Ular Tedong, but this name is applied apparently to a variety of snakes.

The green tree-snake, *Dryophis prasinus*, the Ular Daun of the Malays, is another of our very common snakes. Usually of a bright apple-green, with its long slender whip, like body and its pointed snout, it is easily recognised. It is readily tamed, though when fresh caught it is apt to be snappish. There are two or three colour varieties, the commonest of which next to the green one is light brown, but I have also seen a form banded alternately grey and white. It feeds chiefly I believe on frogs and lizards. I found one on an occasion trying to swallow a *Calotes* in spite of the thorny spikes on its back. The Malays say that if you take the fat of this snake and make a lamp with it and a floating wick, on lighting this in the evening, the whole room or house becomes full of these green snakes, and this diversion is sometimes employed on festal occasions. My informant told me that he had seen this done with perfect success.

No less than thirty-one poisonous snakes are recorded from the Peninsula, but nearly half of these are sea snakes. Very little is known as to the habits of these latter. They are generally taken out of the fishing stakes, where they doubtless go in pursuit of the fish, on which they live.

Bungarus fasciatus has already been alluded to. It is a fairly large powerful snake, of a black colour with yellow bands. It is almost always found near the sea, in tidal waters. In captivity it is vicious and ill-tempered, striking about freely and furiously rattling its tail.

The Cobra is well-known to residents, being quite a common garden snake. The specimens met with in the south of the

peninsula are nearly always inky black, further north they are brown. I have never seen a brown one in Singapore, nor a black one in Penang or Province Wellesley. They appear to be much smaller than the Indian form, a specimen over five feet long being unusual. When annoyed the Cobra sits up in the well-known manner, and makes a very curious snorting noise, holding its mouth open in the form of a circle, and every now and then spitting its saliva at its opponent, whence its name *Naia sputatrix*. It never attempts to bite, but spits with great accuracy. One struck me all over the face at a distance of eight feet, and a student of snakes, who was not aware of this habit in our local variety, was struck in the eye by one he was examining; the saliva, which produces only a slight irritation of the skin of the face, causing some amount of inflammation in the eye, which did not subside for some hours. I have also seen a dog struck in the eye by the saliva, while attacking a cobra, much to his discomfiture. When cornered and defending himself, the cobra is very quick in turning the raised part of the body, which it throws forward for a considerable distance, to deter its enemy, but if left alone, glides away as quickly as it can, taking refuge under a log, or in a hole. It is nocturnal in its habits, remaining in its hole all day, unless disturbed. It generally feeds on mice and toads, but I once found one eating a small snake (*Macropisthodon*). In captivity it is quiet, and usually gentle.

The Hamadryad (*Naia bungarus* or *Ophiophagus elaps*), though not an exceedingly common snake, is probably better known by reputation to residents than any other. It is the biggest of all our poisonous snakes, attaining a length of 13 feet, and is proportionately stout. In colour it is usually a pale brown, without any markings, and as it does not sit up so often as the cobra does, when in danger, and the large poison glands, so conspicuous in many venomous snakes, are not very clearly visible, it is often mistaken for a harmless snake. Its plain brown colour, the large plates on its blunt head, and when irritated, its erect attitude and expanded hood easily distinguish it. It is commonly reported to be very aggressive and to pursue people who irritate it. I have never seen this myself, and it certainly requires further proof. As is well known, it feeds, generally at least, on other snakes, and I have caught one in the act of swallowing a small

python. Although the Indian Hamadryad is easily kept in confinement in England, I have never been able to keep one very long here. It refuses all food, not only its natural food of snakes, but also eggs and milk, which almost every other snake will lick up. The Hamadryad is less common in Singapore now than formerly, I believe, but is occasionally taken. Four or five have been taken in the gardens within the past six or seven years, one about eight feet in length having been caught here last September, but it is fairly abundant in other parts of the peninsula.

The beautiful scarlet and blue *Doliophis bivirgatus* is not common in Singapore. I have only once seen it here, but it is plentiful in the hill woods, where it may be seen basking in the sun on the paths. It occurs in Penang, Malacca, Province Wellesley, Selangor, the Bindings and Kedah, as well as Singapore.

Of the Vipers, by far the commonest is *Lachesis Wagleri*, a vicious looking, but handsome snake, mottled with green, dark blue, yellow and black. Its large flat head, shaped like the ace of spades, and narrow yellow eyes, give it a wicked appearance. It is generally about two feet and a half in length when full grown, and is thick in proportion to its length. It is an arboreal snake, sitting very quietly upon the boughs of trees or bushes, where it catches rats and birds. Young specimens are often plain dull green with a few distant reddish spots, and do not at all resemble the common form. I have seen a female viper opened which contained several young ones, of which all but one were coloured like the adult, while the remaining one was of the plain green form. It occurs all over the peninsula. When annoyed it opens its mouth exceedingly wide, showing its poison fangs, but it is very slow and stupid, creeping away in a leisurely manner. It has a great reputation as a very deadly snake, which I have reason to believe is hardly justified. I have seen one strike a java sparrow on the thigh, producing a considerable flow of blood. The sparrow flew to the end of the cage but showed no signs of poisoning, and remained quite lively till the snake pursued it again and caught it by the head and killed it. A cooly stepped on a young green viper about a foot long, which bit him on the toe. I was not informed of this for over an hour, when I went to see him and found his leg a good deal swollen and he was suffering a good deal of pain, but after rubbing his leg and

treating the bite with permanganate of potash, he very soon got better and was well in a couple of hours. In fact the bite was no worse than that of a centipede. A good sized pariah dog was bitten on the thigh by a full grown and large sized green viper. The wound bled a good deal, and the dog uttered a cry and ran off, but in an hour or two it reappeared none the worse. I have also seen two cases in which coolies stated they had been bitten by green vipers, and in one certainly saw the snake (also a young one), which was said to have bitten the man, but in neither case were there any of the serious symptoms of snake bite; and as the green viper when it bites holds on tight for some time, and does not merely strike without closing his mouth as the cobra does, it must inject a good quantity of the saliva into the wound; wherefore I conclude the animal is not as deadly as it is reputed to be. Fayrer in "Thanatophidia" in writing of *L. gramineus* quotes from Russell and Blyth, both of whom had seen cases of men bitten by green vipers who merely suffered from pain and swelling and recovered, and Russell, experimenting with the poison of this species, found that it killed birds, but that pigs and dogs recovered, so that it may be doubted that any of these vipers are truly deadly. *L. Wagleri* lives very well in captivity, and is quite gentle and very sluggish. Young animals live chiefly on geckos, the bigger ones eat rats and birds, and it is surprising what large rats they will eat. I have given one a large dead rat with its arms stretched stiffly out and quite rigid, but the viper managed to swallow it quite easily getting the sides of its mouth round the projecting arms most skilfully.

The other green coloured viper (*Lachesis gramineus*) of a plain green colour with a reddish tip to its tail, was apparently much more common in Singapore formerly than it is now, for while looking over the collection of serpents in the British Museum I noticed that there were many specimens of this snake, all from early collectors, and very few *L. Wagleri*. Now, however, *L. gramineus* is quite rare. I have only met with one or two, while *L. Wagleri* is, as I have said, very common.

The purple viper *L. purpureo-maculatus*, not a very plentiful snake, seems always to reside on the sea-shore, hiding under rocks or basking in the sun. It is of a very deep purple brown colour, nearly black. I have caught it on the shore at Toas, and

seen it from Blakang Mati.

Two other vipers, *L. sumatranus* and *L. monticola*, are also reported from Singapore and Penang, but they appear to be very rare here.

There can be no doubt that snakes are much scarcer in Singapore than formerly, and this is no doubt due to clearing of much of the jungle, and especially the constant burning of the Lalang, but still a great variety remain here, and some kinds are still remarkably abundant, and those by no means always of the smaller kinds.

It is rather interesting to observe the behaviour of various animals at the sight of snakes. Common monkeys are usually very excited, crowding together to look at it, and chattering loudly. The Mias, who usually inhabits trees taller than snakes are accustomed to ascend, seems to take no notice of one. The binturong, on bringing a cobra near it, turned its face away as if in horror, but really no doubt recognizing that its most vulnerable portion was its face. The Water Mongoose, *Herpestes brachyurus*, like the Indian Mongoose, bristles up its fur and attacks and devours the snake. Some deer, when a large python was brought past their paddock, though at some distance, crowded together at the bars, gazing at it and stamping their feet, evidently recognizing it as a dangerous enemy.

I append a list of our reptiles as far as at present known, based on Mr. Flower's list already referred to, with the addition of later captures and have added all recorded localities. Those marked (!) I have collected myself or have seen in the Singapore Museum. It will be seen how little we know of the fauna of the Native States as yet.

List of Reptiles.

CHELONIA.

- Dermochelys coriacea* Boul. Singapore !
Callagur picta Gray. Penang, Singapore !
Batagur baska Gray. Penang.
Kachuga lineata Gray. Legeh !
Bellia crassicolis Gray. Penang !
Cyclemys platynota Gray. Singapore !
C. amboinensis Daud. Singapore ! Malacca !
Geomyda spinosa Gray. Singapore ! Penang, Dindings ! Legeh !
G. grandis Singapore ! Selangor !
Testudo emys Schl. Penang, Dindings ! Perak.
Chelone mydas L. Dindings ! Kedah !
Ch. imbricata L. Singapore ?
Thalassochelys caretta L. Singapore ! Johore !
Trionyx subplanus Geoff. Singapore, Penang.
Tr. hurum Gray. Penang, Legeh !
Tr. Phayrei Theob. Penang.
Tr. cartilagineus Bodd. Singapore ! Penang.
Pelochelys cantoris Gray. Penang.

CROCODILIDAE.

- Tomistoma schlegeli* S. Müll. Perak, Pahang.
Crocodylus porosus Schn. Singapore ! Johore, Penang, Province
 Wellesley ! Perak ! Selangor ! Kedah, Dindings !
C. porosus Less. Singapore ? Selangor.

LACERTILIDAE.

- Gymnodactylus affinis* Stol. Penang.
G. pulchellus Gray. Penang ! Perak !
Gonatodes Kendalli Gray. Singapore ! Perak.
G. affinis Stol. Penang.

- Aeluroscalabotes felinus* Gthr. Singapore.
Hemidactylus frenatus D. & B. Singapore, Penang ! Perak !
H. gleadowii Murr. Singapore.
H. depressus Gray. Singapore.
H. leschenaultii D. & B. Penang.
H. coctæi D. & B. Penang.
H. platyurus Schn. Penang, Singapore !
Mimetozone floweri Blgr. Penang.
Gehyra mutilata Wieg. Singapore ! Penang ! Perak !
Lepidodactylus ceylonensis Blgr. Singapore.
L. lugubris D. & B. Penang.
Gecko verticillatus Lawr. Singapore, Penang.
G. stentor Cantor Penang
G. monarchus D. & B. Singapore ! Penang, Malacca !
Ptychozoon homalocephalum Grey. Penang, Singapore !
P. horsfieldi Gray Singapore, Penang.
Draco volans L. Singapore ! Penang, Malacca, Dindings ! Kedah !
D. maculatus Gray Penang.
D. fimbriatus Kuhl. Singapore, Penang.
D. quinquifasciatus Gray. Penang, Selangor !
D. melanopogon Blgr. Malacca, Singapore !
Aphaniotis fusca Ptrs. Malacca.
Gonyocephalus herveyi Blgr. Malacca.
G. borneensis Schl. Malacca, Perak !
G. grandis Gray. Penang.
Acanthosaura armata Gray. Singapore, Penang.
Calotes cristatellus Kuhl. Singapore, Penang, Selangor, Kemaman !
C. versicolor Daud. Singapore, Penang, Kedah, Province Wellesley !
Liolepis bellii Gray. Malacca ! Pahang ! Dindings ! Penang, Province Wellesley.
Varanus flavescens Gray. Penang.
V. nebulosus Gray. Penang, Malacca, Singapore !
V. rudicollis Gray. Malacca.
V. salvator Laur. Singapore ! Penang, Kedah, Pahang ! Dindings ! Malacca !
Mabuia novemcarinata And. Penang.
M. multifasciata Kuhl. Singapore ! Penang.
Lygosoma anomalopus Blgr. Penang.

- Lygosoma olivaceum* Gray Singapore! Penang.
L. singaporense Singapore.
L. jerdonianum Stol. Penang.
L. Bowringii Gthr. Singapore.
L. albopunctatum Gray. Singapore, Penang.
L. chalcides L. Singapore, Penang.

OPHIDIA.

- Typhlops lineatus* Boie. Singapore, Penang, Malacca.
T. braminus Daud. Singapore! Penang.
T. bothriorhynchus Gunther. Penang.
T. nigro-albus D. & B. Singapore, Perak, Penang.
Python reticulatus Schn. Singapore! Penang, Perak! Selangor!
P. molurus L. Province Wellesley?
P. curtus Schl. Singapore! Malacca, Selangor?
Cylindrophis rufus Lawr. Singapore! Penang.
C. lineatus Blanf. Singapore!
Xenopeltis unicolor Reinh. Singapore! Penang!
Acrochordus javanicus Hornst. Singapore, Penang, Pahang.
Chersydrus granulatus Schn. Singapore! Penang.
Xenodermus javanicus Reinh. Penang?
Polyodontophis geminatus Boie. Singapore, Malacca.
P. sagittarius Cant. ?
Xenochropis cerasogaster Cant. Province Wellesley.
Tropidonotus trianguligerus Boie. Singapore! Penang.
T. piscator Schn. Singapore, Penang!
T. stolatus L. Singapore.
T. vittatus L. Penang.
T. chrysargus Perak!
T. subminiatus Schl. Penang, Perak.
T. maculatus Edel. Malacca.
Macropisthodon flaviceps D. & B. Perak.
M. rhodomelas Boie. Singapore! Pahang!
Helicops schistosus Daud. ?
Lycodon auticus L. Singapore! Penang.
L. effrenis Cant. Penang.
L. subcinctus Boie. Singapore! Penang, Kemaman!
Dryocalamus subannulatus D. Singapore! Province Wellesley.
Zaocys carinatus Gthr. Singapore! Perak.

- Zamenis korros* Schl. Singapore, Penang, Perak.
Z. mucosus L. Singapore.
Z. fasciolatus Shaw. Province Wellesley.
Xenelaphis hexagonotus Cant. Singapore! Penang, Pahang!
Coluber porphyraceus Cant. Singapore.
C. oxycephalus Boie. Singapore, Penang, Pahang!
C. taniurus Johore! Selangor!
C. melanurus Schl. Singapore! Province Wellesley, Penang.
C. radiatus Schl. Singapore! Penang.
C. Hodgsoni Singapore!
Gonyophis margaritatus Ptrs. Singapore.
Dendrophis pictus Boie. Singapore, Perak, Kedah, Selangor!
D. formosus Boie. Singapore! Province Wellesley, Selangor!
Dendrelaphis caudolineatus Gray. Singapore! Pahang! Penang
 Perak.
Macrocalamus lateralis Perak.
Simotes purpurascens Schl. Singapore! Johore, Penang.
S. cyclocurus Cant. Penang, Singapore!
S. octolineatus Schn. Singapore! Perak.
S. signatus Gthr. Singapore!
S. cruentatus Gthr. Penang.
Ablabes tricolor Schl. Singapore!
A. baliodetrus Boie. Penang, Province Wellesley, Perak, Bujong
 Malacca!
A. longicauda Ptrs. Penang.
Pseudorhabdium longiceps Cantor. Singapore, Penang, Perak.
Calamaria albiventer Gray Penang.
C. sumatrana Edel. Singapore.
C. leucocephala D. & B. Singapore, Penang!
C. pavementata D. & B. Penang! Province Wellesley.
Hypsirhina plumbea Boie. Penang.
H. enhydria Schn. Singapore, Penang.
H. Sieboldii Schl. Province Wellesley.
Homalopsis buccata L. Singapore! Malacca, Penang.
Cerberus rhynchops Schn. Singapore! Penang, Selangor!
Fordonia leucobatia Schl. Singapore! Penang.
Cantoria violacea Gir. Singapore!
Hipistes hydrinus Cant. Singapore, Penang, Kedah.
Dipsadomorphus multimaculatus Boie. Penang.

- D. Gokool* Gray. Penang.
D. dendrophilus Boie. Singapore, Penang, Kedah, Din lings, Perak !
D. jaspideus D. and B. Penang.
D. Drapiezii Boie. Singapore ! Malacca.
D. cynodon Boie. Singapore ! Province Wellesley, Malacca, Perak ! (Gunong Keledang).
Psammodynastes pulverulentus Boie. Penang, Perak.
Eryophis xanthozona Boie. Penang.
D. prasinus Boie. Singapore ! Penang, Pahang !
D. rubescens Gray. Penang.
Chrysopetala ornata Shaw. Singapore ! Penang ! Kedah, Jelebu !
D. chrysochlora Reinw. Singapore ! Penang.
Hydros platurus L. Singapore ! Province Wellesley.
Hydrophis cœrulescens Shaw Penang.
H. Cantoris Gthr. Penang.
H. fasciatus Schn. Penang.
H. torquatus Gthr. ?
Distira Stokesii Gray Singapore !
D. Brugmansii Boie. Penang.
D. cyanocincta Daud. Singapore.
D. Jerdonii Gray Penang.
Enhydris Hardwickii Gray Singapore.
Enhydrina Valakailien. Boie. Penang.
Aipysurus Eydonxi Gray. Singapore.
Platurus colubrinus Schn. Singapore ! Penang.
Bungarus fasciatus Schn. Singapore ! Penang, Province Wellesley, Pahang ! Malacca !
B. candidus L. Kedah, Penang.
B. flaviceps Reinh. Penang, Province Wellesley.
Naja tripudians Merr. Singapore ! Penang, Province Wellesley ; Kedah.
N. bungarus Schl. Singapore ! Penang, Province Wellesley, Pahang ! Selangor ! Perak.
Callophis gracilis Gray. Singapore, Penang.
C. maculiceps Gthr. Province Wellesley.
Doliophis bivirgatus Boie. Singapore ! Malacca, Din lings ! Penang, Selangor ! Province Wellesley, Kedah.
D. intestinalis Laur. Singapore, Penang, Malacca, Province Wellesley, Pahang !

Haplopeltura Boa Boie. Penang.

Amblycephalus lavis Boie. Malacca ?

A. malaccanus Ptrs. Malacca.

Lachesis monticola Gthr. Singapore, Penang.

L. purpureomaculatus Gray. Singapore ! Penang.

L. gramineus Shaw. Singapore ! Penang.

L. sumatranus Raffles. Singapore.

L. Wagleri Boie. Singapore ! Penang, Malacca, Perak ! Selangor ! Pahang !